Exhibit A
SCOPE OF WORK

TECHNICAL TASK LIST

Task #	CPR	Task Name
1	N/A	Administration
2		Cooling Test Design and Construction
3		Cooling Analysis
4	X	Cooling Model Validation
5		Deploy and Commission 25 Meter Hyperlight^{tm}
6	X	Test 2 25 Meter Hyperlight^{tm} Rigs
7		Idle Farm Utility Scale Power Purchase Agreement Analysis
8		Utility Interconnection Technical Analysis
9	X	Final Design of The 200 Meter Unit
10		Final Site Engineering
11		Installation of the 200 Meter Unit
12		Operate the 70 Unit 200 Meter Hyperlight^{tm} Project

KEY NAME LIST

Task #	Key Personnel	Key Subcontractor(s)	Key Partner(s)
1	King, Matthys	UCSB, Cal Poly	
2	Matthys	UCSB, Cal Poly	
3	Matthys	UCSB, Cal Poly	
4	Matthys	UCSB, Cal Poly	
5	King		
6	King		
7	Lopez	Alejo Lopez	
8	King		
9	King		
10	Hays	Power Engineers	
11	Webb	4 Granite Inc.	
12	None		

GLOSSARY

Specific terms and acronyms used throughout this work statement are defined as follows:

Acronym	Definition
ALG	Advanced Lab Group
CAD	Computer Aided Design
Cal Poly	California Polytechnic State University, San Luis Obispo
CLFR	Compact Linear Fresnel Reflector
CPC	Combined Power Cooperative (ALG is changing its name to this)
CPR	Critical Project Review
Energy Commission	California Energy Commission
HCE	Heat Collection Element
PPA	Power Purchase Agreement
PIER	Public Interest Energy Research
RFP	Request for Proposals
RPS	Renewable Portfolio Standard
UCC.1	Uniform Commercial Code (Financing Statement)

Problem Statement

Solar energy is playing an important role in helping California achieve its renewable portfolio standard goals. Utility scale solar development, however, requires an immense amount of land and can have negative impacts on surrounding species and habitats, particularly in the desert. Concentrating solar projects may also use a significant amount of water. The environmental footprint of these technologies may then prove a barrier to greater penetration of this renewable energy source. Thus, there is a need for innovative solar technologies that reduce land or water demand per unit generation relative to current technologies.

To identify such technologies and strategies, the PIER Energy-Related Environmental Program, in conjunction with the PIER Renewable Program, released a request for proposals to identify such innovative solar technologies. The Combined Power Cooperative's Hyperlight^{TM} Concentrating Linear Fresnel Reflector (CLFR) system is one such approach. This technology uses a floating array of flexible, lightweight reflectors instead of mirrors. The water used to float the reflectors also serves as a heat exchanger that enables cooling of the power generator block with the potential of minimal water loss.

The technology has the potential to achieve the technical objectives of the solicitation by enabling a utility scale solar technology with reduced demands on land and fresh water, as well as greater flexibility in plant configuration and footprint shape, expanding site selection options and opportunity for avoidance of sensitive or undisturbed habitats and increased utilization of disturbed or developed land.

Goals of the Agreement

The overall goal of the project is to develop and demonstrate the Combined Power Cooperative's "Hyperlight™" concentrated solar reflector system for a CLFR, which simultaneously serves as a heat exchanger that enables steam condensation without significant water evaporation.

The Hyperlight™ reflector field is made of transparent plastic tubes, with a metalized polymer reflective facet mounted inside, that reflects sunlight onto a heat collecting element centered above the array of tubes. Instead of metal being used for the structural support of the solar reflectors, the plastic tubes are floated on water (with a water ballast). Evaporation of the water used to float the reflector containing tubes is greatly reduced by the tight spacing of the tubes on the water surface – which is another key aspect of this technology.

The system operates with the array of Hyperlight™ reflectors concentrating solar energy on a heat collection element in a Compact Linear Fresnel Reflector system where steam is generated in a pipe within the heat collection element, and directed to a turbine for power generation. After generating power, the steam is cooled in a condenser using cooling water drawn from the water-filled basin that the Hyperlight™ tubular reflectors float in. The heated water from the condenser is then returned to the basin. Instead of the basin being cooled by evaporation, as in a regular cooling pond, evaporation is significantly reduced by the floating Hyperlight™ tubes, and the basin is instead cooled by convection from air blown through the floating Hyperlight™ tubes.

Objectives of the Agreement

The specific objectives of the project are to:

1) Increase the size of the Hyperlight™ demonstration units.

2) Improve system thermal efficiency from 17% to 30%.

3) Reduce evaporative water loss to less than 10%.

4) Validate predictive cooling model.

TASK 1.0 ADMINISTRATION

MEETINGS

Task 1.1 Attend Kick-off Meeting

The goal of this task is to establish the lines of communication and procedures for implementing this Agreement.

The Contractor shall:

- Attend a "kick-off" meeting with the Commission Contract Manager, the Contracts Officer, and a representative of the Accounting Office. The Contractor shall bring their Project Manager, Contracts Administrator, Accounting Officer, and others designated by the Commission Contract Manager to this meeting. The administrative and technical aspects of this Agreement will be discussed at the meeting. Prior to the kick-off meeting, the Commission Contract Manager will provide an agenda to all potential meeting participants.

  The administrative portion of the meeting shall include, but not be limited to, the following:

  - Terms and conditions of the Agreement
  - CPRs (Task 1.2)
  - Match fund documentation (Task 1.7)
  - Permit documentation (Task 1.8)

  The technical portion of the meeting shall include, but not be limited to, the following:

  - The Commission Contract Manager's expectations for accomplishing tasks described in the Scope of Work;
  - An updated Schedule of Deliverables
  - Progress Reports (Task 1.4)
  - Technical Deliverables (Task 1.5)
  - Final Report (Task 1.6)

  The Commission Contract Manager shall designate the date and location of this meeting.

Contractor Deliverables:

- An Updated Schedule of Deliverables
- An Updated List of Match Funds
- An Updated List of Permits

Commission Contract Manager Deliverables:

- Final Report Instructions

Task 1.2 CPR Meetings

The goal of this task is to determine if the project should continue to receive Energy Commission funding to complete this Agreement and if it should, are there any modifications that need to be made to the tasks, deliverables, schedule or budget.

CPRs provide the opportunity for frank discussions between the Energy Commission and the Contractor. CPRs generally take place at key, predetermined points in the Agreement, as determined by the Commission Contract Manager and as shown in the Technical Task List above and in the Schedule of Deliverables. However, the Commission Contract Manager may schedule additional CPRs as necessary, and any additional costs will be borne by the Contractor.

Participants include the Commission Contract Manager and the Contractor, and may include the Commission Contracts Officer, the PIER Program Team Lead, other Energy Commission staff and Management as well as other individuals selected by the Commission Contract Manager to provide support to the Energy Commission.

The Commission Contract Manager shall:

- Determine the location, date and time of each CPR meeting with the Contractor. These meetings generally take place at the Energy Commission, but they may take place at another location.
- Send the Contractor the agenda and a list of expected participants in advance of each CPR. If applicable, the agenda shall include a discussion on both match funding and permits.
- Conduct and make a record of each CPR meeting. One of the outcomes of this meeting will be a schedule for providing the written determination described below.
- Determine whether to continue the project, and if continuing, whether or not to modify the tasks, schedule, deliverables and budget for the remainder of the Agreement, including not proceeding with one or more tasks. If the Commission Contract Manager concludes that satisfactory progress is not being made, this conclusion will be referred to the Energy Commission's Research, Development and Demonstration Policy Committee for its concurrence.
- Provide the Contractor with a written determination in accordance with the schedule. The written response may include a requirement for the Contractor to revise one or more deliverable(s) that were included in the CPR.

The Contractor shall:

- Prepare a CPR Report for each CPR that discusses the progress of the Agreement toward achieving its goals and objectives. This report shall include recommendations and conclusions regarding continued work of the projects. This report shall be submitted along with any other deliverables identified in this Scope of Work. Submit these documents to the Commission Contract Manager and any other designated reviewers at least 15 working days in advance of each CPR meeting.
- Present the required information at each CPR meeting and participate in a discussion about the Agreement.

Contractor Deliverables:

- CPR Report(s)
- CPR deliverables identified in the Scope of Work

Commission Contract Manager Deliverables:

- Agenda and a List of Expected Participants
- Schedule for Written Determination
- Written Determination

Task 1.3 Final Meeting

The goal of this task is to closeout this Agreement.

The Contractor shall:

- Meet with the Energy Commission to present the findings, conclusions, and recommendations. The final meeting must be completed during the closeout of this Agreement.

  This meeting will be attended by, at a minimum, the Contractor, the Commission Contracts Officer, and the Commission Contract Manager. The technical and administrative aspects of Agreement closeout will be discussed at the meeting, which may be two separate meetings at the discretion of the Commission Contract Manager.

  The technical portion of the meeting shall present findings, conclusions, and recommended next steps (if any) for the Agreement. The Commission Contract Manager will determine the appropriate meeting participants.

  The administrative portion of the meeting shall be a discussion with the Commission Contract Manager and the Contracts Officer about the following Agreement closeout items:

  - What to do with any state-owned equipment (Options)
  - Need to file UCC.1 form re: Energy Commission's interest in patented technology
  - Energy Commission's request for specific "generated" data (not already provided in Agreement deliverables)
  - Need to document Contractor's disclosure of "subject inventions" developed under the Agreement
  - "Surviving" Agreement provisions, such as repayment provisions and confidential deliverables
  - Final invoicing and release of retention
- Prepare a schedule for completing the closeout activities for this Agreement.

Deliverables:

- Written documentation of meeting agreements and all pertinent information
- Schedule for completing closeout activities

REPORTING

See Exhibit D, Reports/Deliverables/Records.

Task 1.4 Monthly Progress Reports

The goal of this task is to periodically verify that satisfactory and continued progress is made towards achieving the research objectives of this Agreement.

The Contractor shall:

- Prepare progress reports which summarize all Agreement activities conducted by the Contractor for the reporting period, including an assessment of the ability to complete the Agreement within the current budget and any anticipated cost overruns. Each progress report is due to the Commission Contract Manager within 10 working days after the end of the reporting period. Attachment A-2, Progress Report Format, provides the recommended specifications.

Deliverables:

- Monthly Progress Reports

Task 1.5 Test Plans, Technical Reports and Interim Deliverables

The goal of this task is to set forth the general requirements for submitting test plans, technical reports and other interim deliverables, unless described differently in the Technical Tasks. When creating these deliverables, the Contractor shall use and follow, unless otherwise instructed in writing by the Commission Contract Manager, the latest version of the PIER Style Manual published on the Energy Commission's web site:

http://www.energy.ca.gov/contracts/pier/contractors/

The Contractor shall:

- Unless otherwise directed in this Scope of Work, submit a draft of each deliverable listed in the Technical Tasks to the Commission Contract Manager for review and comment in accordance with the approved Schedule of Deliverables. The Commission Contract Manager will provide written comments back to the Contractor on the draft deliverable within 10 working days of receipt. Once agreement has been reached on the draft, the Contractor shall submit the final deliverable to the Commission Contract Manager. The Commission Contract Manager shall provide written approval of the final deliverable within 5 working days of receipt. Key elements from this deliverable shall be included in the Final Report for this project.

Task 1.6 Final Report

The goal of this task is to prepare a comprehensive written Final Report that describes the original purpose, approach, results and conclusions of the work done under this Agreement. The Commission Contract Manager will review and approve the Final Report. The Final Report must be completed on or before the termination date of the Agreement. When creating these deliverables, the Contractor shall use and follow, unless otherwise instructed in writing by the Commission Contract Manager, the latest version of the PIER Style Manual published on the Energy Commission's web site:

http://www.energy.ca.gov/contracts/pier/contractors/

The Final Report shall be a public document. If the Contractor has obtained confidential status from the Energy Commission and will be preparing a confidential version of the Final Report as well, the Contractor shall perform the following subtasks for both the public and confidential versions of the Final Report.

Task 1.6.1 Final Report Outline

The Contractor shall:

- Prepare a draft outline of the Final Report.
- Submit the draft outline of Final Report to the Commission Contract Manager for review and approval. The Commission Contract Manager will provide written comments back to the Contractor on the draft outline within 10 working days of receipt. Once agreement has been reached on the draft, the Contractor shall submit the final outline to the Commission Contract Manager. The Commission Contract Manager shall provide written approval of the final outline within 5 working days of receipt.

Deliverables:

- Draft Outline of the Final Report
- Final Outline of the Final Report

Task 1.6.2 Final Report

The Contractor shall:

- Prepare the draft Final Report for this Agreement in accordance with the approved outline.
- Submit the draft Final Report to the Commission Contract Manager for review and comment. The Commission Contract Manager will provide written comments within 10 working days of receipt.

  Once agreement on the draft Final Report has been reached, the Commission Contract Manager shall forward the electronic version of this report for Energy Commission internal approval. Once the approval is given, the Commission Contract Manager shall provide written approval to the Contractor within 5 working days.

- Submit one bound copy of the Final Report with the final invoice.

Deliverables:

- Draft Final Report
- Final Report

MATCH FUNDS, PERMITS, AND ELECTRONIC FILE FORMAT

Task 1.7 Identify and Obtain Matching Funds

The goal of this task is to ensure that the match funds planned for this Agreement are obtained for and applied to this Agreement during the term of this Agreement.

The costs to obtain and document match fund commitments are not reimbursable through this Agreement. While the PIER budget for this task will be zero dollars, the Contractor may utilize match funds for this task. Match funds shall be spent concurrently or in advance of PIER funds during the term of this Agreement. Match funds must be identified in writing, and the associated commitments obtained before the Contractor can incur any costs for which the Contractor will request reimbursement.

The Contractor shall:

- Prepare a letter documenting the match funding committed to this Agreement and submit it to the Commission Contract Manager at least 2 working days prior to the kick-off meeting:
    1. If no match funds were part of the proposal that led to the Energy Commission awarding this Agreement and none have been identified at the time this Agreement starts, then state such in the letter.
    2. If match funds were a part of the proposal that led to the Energy Commission awarding this Agreement, then provide in the letter:
        - A list of the match funds that identifies the:
            - Amount of each cash match fund, its source, including a contact name, address and telephone number and the task(s) to which the match funds will be applied.
            - Amount of each in-kind contribution, a description, documented market or book value, and its source, including a contact name, address and telephone number and the task(s) to which the match funds will be applied. If the in-kind contribution is equipment or other tangible or real property, the Contractor shall identify its owner and provide a contact name, address and telephone number, and the address where the property is located.
        - A copy of the letter of commitment from an authorized representative of each source of cash match funding or in-kind contributions that these funds or contributions have been secured.

- Discuss match funds and the implications to the Agreement if they are significantly reduced or not obtained as committed, at the kick-off meeting. If applicable, match funds will be included as a line item in the progress reports and will be a topic at CPR meetings.
- Provide the appropriate information to the Commission Contract Manager if during the course of the Agreement additional match funds are received.
- Notify the Commission Contract Manager within 10 working days if during the course of the Agreement existing match funds are reduced. Reduction in match funds may trigger an additional CPR.

Deliverables:

- A letter regarding Match Funds or stating that no Match Funds are provided
- Letter(s) for New Match Funds
- A copy of each Match Fund commitment letter
- Letter that Match Funds were Reduced (if applicable)

Task 1.8 Identify and Obtain Required Permits

The goal of this task is to obtain all permits required for work completed under this Agreement in advance of the date they are needed to keep the Agreement schedule on track.

Permit costs and the expenses associated with obtaining permits are not reimbursable under this Agreement. While the PIER budget for this task will be zero dollars, the Contractor shall show match funds for this task. Permits must be identified in writing and obtained before the Contractor can incur any costs related to the use of the permits for which the Contractor will request reimbursement.

The Contractor shall:

- Prepare a letter documenting the permits required to conduct this Agreement and submit it to the Commission Contract Manager at least 2 working days prior to the kick-off meeting:
    1. If there are no permits required at the start of this Agreement, then state such in the letter.
    2. If it is known at the beginning of the Agreement that permits will be required during the course of the Agreement, provide in the letter:
        - A list of the permits that identifies the:
            - Type of permit
            - Name, address and telephone number of the permitting jurisdictions or lead agencies
        - Schedule the Contractor will follow in applying for and obtaining these permits.

- The list of permits and the schedule for obtaining them will be discussed at the kick-off meeting, and a timetable for submitting the updated list, schedule and the copies of the permits will be developed. The implications to the Agreement if the permits are not obtained in a timely fashion or are denied will also be discussed. If applicable, permits will be included as a line item in the progress reports and will be a topic at CPR meetings.
- If during the course of the Agreement additional permits become necessary, then provide the appropriate information on each permit and an updated schedule to the Commission Contract Manager.
- As permits are obtained, send a copy of each approved permit to the Commission Contract Manager.
- If during the course of the Agreement permits are not obtained on time or are denied, notify the Commission Contract Manager within 5 working days. Either of these events may trigger an additional CPR.

Deliverables:

- A letter documenting the Permits or stating that no Permits are required
- Updated list of Permits as they change during the Term of the Agreement
- Updated schedule for acquiring Permits as it changes during the Term of the Agreement
- A copy of each approved Permit

Task 1.9 Electronic File Format

The goal of this task is to unify the formats of electronic data and documents provided to the Energy Commission as contract deliverables. Another goal is to establish the computer platforms, operating systems and software that will be required to review and approve all software deliverables.

The Contractor shall:

- Deliver documents to the Commission Contract Manager in the following formats:
  - Data sets shall be in Microsoft (MS) Access or MS Excel file format.
  - PC-based text documents shall be in MS Word file format.
  - Documents intended for public distribution shall be in PDF file format, with the native file format provided as well.
  - Project management documents shall be in MS Project file format.
- Request exemptions to the electronic file format in writing at least 90 days before the deliverable is submitted.

Deliverables:

- A letter requesting exemption from the Electronic File Format (if applicable)

TECHNICAL TASKS

The Contractor shall prepare all deliverables in accordance with the requirements in Task 1.5. Deliverables not requiring a draft version are indicated by marking "(no draft)" after the deliverable name.

Task 2 COOLING TEST DESIGN AND CONSTRUCTION

The goal of this task is to instrument the research pond. Data Collection will be made for temperature, air and water flow rates, and weather conditions.

The Contractor shall:

- Instrument pond with the data acquisition system which will consist of:
  - 150 thermocouples mounted in the support water in the test pond.
  - Air flow meter and thermocouple on exit air manifold.
  - Weather station
    - Temperature
    - Barometric pressure
    - Relative Humidity
    - Insolation
- Write software to interface with data collection
- Provide training on data acquisition
- Prepare data collection Instructions document

Deliverables:

- Pond Instrumentation Specifications (no draft)
- Pond Data Collection Instructions Manual (no draft)

Task 3 COOLING ANALYSIS

The goal of this task is to develop a prediction tool for heat transfer rates between air and water.

The Contractor shall:

- Develop a model that will predict heat and evaporation losses to the atmosphere from pond water when used as a heat sink for steam condensation
- Prepare a report describing development of the predictive model

Deliverables:

- Predictive Model Development Report (no draft)

Task 4 COOLING MODEL VALIDATION

The goal of this task is to validate the model with additional data collection.

The Contractor shall:

- Collect additional data from instrumented pond in Task 2.
- Validate model with additional data collection
- Revise model as necessary to improve predictive power.
- Prepare a research Cooling Pond Report summarizing additional data collection, model performance and model revisions, if necessary.

Deliverables:

- Cooling Pond Report (no draft)

Task 5 DEPLOY AND COMMISSION 25 METER HYPERLIGHT™

The goal of this task is to build the bulkheads that will hold 35 Hyperlight™ tubes and then install the tubes. Major design work on the bulkheads will be completed prior to contract start.

The Contractor shall:

- Fabricate and install 35 tube bulkheads and install 25 meter Hyperlight™ tubing.
- Prepare an Installation Report, which describes the fabrication and installation of two 35-tube rigs.

Deliverables:

- Installation Report, not to include configuration and technique for installing Hyperlight™ or issues, solutions, work-arounds during installation. (no draft),

Task 6 TEST TWO 35-TUBE, 25-METER LONG RIGS

The goal of this task is to test the thermal efficiency and performance of two 35-tube Hyperlight™ rigs at 25-meter length scale in the Santee or other location as approved by Commission Contract Manager for one month.

The Contractor shall:

- Operate two 35-tube Hyperlight™ rigs at the 25-meter length for one month at Santee location (or other approved location) to establish baseline thermal efficiency.
- Data collected shall include:
    - Average Insolation (W/m2) during test
    - temperatures of water entering and exiting Heat Collection Element's (HCE) Flow rate = through HCE's
    - Maximum temperature/pressure achievable in system

- Tune system as necessary
- Prepare a Performance Summary Report to include all activities of this task

Deliverables:

- Performance Summary Report (no draft)

Task 7 IDLE FARM UTILITY SCALE POWER PURCHASE AGREEMENT ANALYSIS

The purpose of this task is to identify the economic and regulatory considerations for deploying Hyperlight™ installations on non-contiguous agricultural parcels.

The Contractor shall:

- Analyze land lease structures and use agreements that ensure compatibility with agricultural uses and facilitate project development
- Analyze power purchase agreement considerations of the Hyperlight™ model
- Prepare a power purchase analysis report describing the results of the land lease structure and use agreement analysis and the interconnection and power purchase agreement analysis
- Prepare a Hyperlight™ power purchase agreement that consists of terms and conditions specifically suited to the types of sites addressed in this analysis.

Deliverables:

- Power Purchase Agreement Analysis Report
- Hyperlight™ Power Purchase Agreement Template (no draft)

Task 8 UTILITY INTERCONNECTION TECHNICAL ANALYSIS

The purpose of this task is to identify issues associated with integrating Hyperlight™ into the grid.

The Contractor shall:

- Analyze utility interconnection technical requirements
- Prepare a Utility Interconnection Analysis report which identifies major issues regarding utility interconnection with the Hyperlight™ system.

Deliverables:

- Utility Interconnection Analysis Report (no draft)

Task 9 FINAL DESIGN OF 200 METER UNIT

The goal of this task is to design two 35-tube Hyperlight™ rigs at the 200-meter length. This task is focused on final earthwork design, and final design of the anchoring system for the lateral support frame.

The Contractor shall:

- Design two 35-tube Hyperlight™ rigs at 200-meter length scale, conduct design reviews, and complete designs.
- Prepare computer aided design (CAD) drawings of earthwork design
- Prepare CAD model of lateral support frame and anchors
- Prepare a Design Report, which includes final design plans and parts list.

Deliverables:

- Design Report, not to include: final design of outer frame, bulkhead, end-caps, actuators, control system. (no draft)

Task 10 FINAL SITE ENGINEERING

The goal of this task is to finalize site engineering including customer interconnection.

The Contractor shall:

- Generate designs for final site engineering and customer interconnection, conduct design reviews, and complete designs
- Prepare a Site Engineering report, including CAD drawings of the engineered systems and a parts list.

Deliverables:

- Site Engineering Report, not to include: plumbing, electrical, mechanical, civil specifications (no draft)

Task 11 INSTALLATION OF THE 200 METER UNIT

The goal of this task is to build one Hyperlight™ unit, composed of two 35-tube Hyperlight™ rigs at the 200-meter length.

The Contractor shall:

- Build one full scale unit consisting of two 35-tube Hyperlight™ rigs at the 200-meter length at a demonstration site approved by the Commission Contract Manager, in California.
- Commission the Hyperlight™ system
- Prepare a Commissioning Report describing the commissioning of the system.

Deliverables:

- Commissioning Report, not to include: Start-up and activation procedures, issues, solutions, and work-arounds during commissioning. (no draft)

Task 12 OPERATE THE 70 UNIT 200 METER HYPERLIGHT™ PROJECT

The goal of this task is to test one, 70-tube Hyperlight™ unit at 200-meter length scale, including electricity generation.

The Contractor shall:

- Test one full scale Hyperlight™ unit
- Quantify thermal efficiency achieved.
- Generate electricity using steam from the Hyperlight unit.
- Prepare a Performance Summary Report describing the performance of the Hyperlight™ unit, including performance of the Hyperlight tubes and other components and steam temperature and pressure generated.

Deliverables:

- Performance Summary Report (no draft)